



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Kimiko MUROFUSHI et al.

Group Art Unit: 1614

Appln. No. : 10/516,315 ✓

Examiner: SHIAO

I.A. Filed : June 10, 2003

For : CARBACYCLIC PHOSPHATIDIC ACID DERIVATIVE

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
U.S. Patent and Trademark Office  
Customer Service Window, Mail Stop Amendment  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Sir:

In accordance with the duty of disclosure under 37 C.F.R. 1.56, 1.97, and 1.98, Applicant hereby brings the following information to the attention of the Examiner, which includes information cited and discussed in the specification, the International Search Report, the Written Opinion and the International Preliminary Examination Report issued in connection with counterpart International Application No. PCT/JP03/07335 of which the present application is the national stage. Copies of the International Search Report (in English and Japanese), the Written Opinion (in Japanese) and the International Preliminary Examination Report (in Japanese) were enclosed with the papers when entering the National Stage on December 10, 2004, and a copy of the International Preliminary Examination Report in English is enclosed. The Examiner is invited to review these materials to inspect the relevance indicated during international examination with respect to the documents cited therein.

W.H. MOOLENAAR, Exp. Cell. Res., Vol. 253, pp. 230-238, 1999, which is cited and discussed in the specification beginning on page 1, second paragraph;

Z. GUO et al., Proc. Natl. Acad. Sci. USA, Vol. 93, pp. 14367-14372, 1996, which is cited and discussed in the specification beginning on page 1, second paragraph;

HECHT, J. et al., J. Cell Biol., Vol. 135, pp. 1071-1083, 1996, which is cited and discussed in the specification beginning on page 1, second paragraph;

S. AN et al., J. Biol. Chem., Vol. 273, pp. 7906-7910, 1998, which is cited and discussed in the specification beginning on page 1, second paragraph;

K. BANDO et al., J. Biol. Chem., Vol. 274, pp. 27776-27785, 1999, which is cited and discussed in the specification beginning on page 1, second paragraph;

D.-S. IM et al., Mol. Pharmacol., Vol. 57, pp. 753-759, 2000, which is cited and discussed in the specification beginning on page 1, second paragraph;

VAN CORVEN, E., et al., Cell, Vol. 59, pp. 45-54, 1989, which is cited and discussed in the specification beginning on page 1, third paragraph;

UMANSKY, S. R. et al., Cell Death Diff., Vol. 4, pp. 608-616, 1997, which is cited and discussed in the specification beginning on page 1, third paragraph;

A. GOHLA et al., J. Biol. Chem., Vol. 273, pp. 4653-4659, 1998, which is cited and discussed in the specification beginning on page 1, third paragraph;

TIGYI, G. et al., J. Biol. Chem., Vol. 267, pp. 21360-21367, 1992, which is cited and discussed in the specification beginning on page 1, third paragraph;

JALINK, K. et al., Cell Growth & Differ., Vol. 4, pp. 247-255, 1993, which is cited and discussed in the specification beginning on page 2, line 1;

JALINK, K. et al., J. Cell Biol., Vol. 126, pp. 801-810, 1994, which is cited and discussed in the specification beginning on page 2, line 1;

TIGYI, G. et al., J. Neurochem., Vol. 66, pp. 537-548, 1996, which is cited and discussed in the specification beginning on page 2, line 2;

IMAMURA, F. et al., Biochem. Biophys. Res. Commun., Vol. 193, pp. 497-503, 1993, which is cited and discussed in the specification beginning on page 2, line 3;

K. L. O'CONNOR et al., J. Cell. Biol., Vol. 143, pp. 1749-1760, 1998, which is cited and discussed in the specification beginning on page 2, line 4;

J. C. STAM et al., EMBO J., Vol. 17, pp. 4066-4074, 1998, which is cited and discussed in the specification beginning on page 2, line 4;

MURAKAMI-MUROFUSHI, K. et al., J. Biol. Chem., Vol. 267, pp. 21512-21517, 1992, which is cited and discussed in the specification beginning on page 2, first full paragraph;

KOBAYASHI, T. et al., Life Sciences, Vol. 65, pp. 2185-2191, 1999, which is cited and discussed in the specification beginning on page 2, last paragraph;

LILIOM, K. et al., Am. J. Physiol., Vol. 274, pp. C1065-1074, 1998, which is cited and discussed in the specification beginning on page 3, line 1;

MURAKAMI-MUROFUSHI, K. et al., Cell Struct. Funct., Vol. 18, pp. 363-370, 1993, which is cited and discussed in the specification beginning on page 3, first full paragraph;

P. L. HORDIJK et al., J. Biol. Chem., Vol. 269, pp. 3534-3538, 1994, which is cited and discussed in the specification beginning on page 3, second full paragraph;

L. R. HOWE et al., J. Biol. Chem., Vol. 268, pp. 20717-20720, 1993, which is cited and discussed in the specification beginning on page 3, second full paragraph;

T. KOBAYASHI et al., Protein, Nucleic Acid and Enzyme, Vol. 44, pp. 1118-1125, 1999, which is cited and discussed in the specification beginning on page 3, second full paragraph;

MUKAI, M. et al., Int. J. Cancer, Vol. 81, pp. 918-922, 1999, which is cited and discussed in the specification beginning on page 4, first full paragraph;

AKEDO, H. et al., Cancer Res., Vol. 46, pp. 2416-2422, 1986, which is cited and discussed in the specification beginning on page 4, last paragraph;

M. MUKAI et al., FEBS Letters, Vol. 484, pp. 69-73, 2000, which is cited and discussed in the specification beginning on page 5, first full paragraph;

Japanese Patent Application No. 2001-150685, which is cited and discussed in the specification beginning on page 5, last paragraph, which is a family member of the below cited WO 02/094286 and U.S. Patent Application No. 10/477,210 to MUKAI et al. (which published as U.S. Patent Application Publication No. 2004/0214799 A1);

Karoly LILIOM et al., "*N*-Palmitoyl-serine and *N*-Palmitoyl-tyrosine Phosphoric Acids Are Selective Competitive Antagonists of the Lysophosphatidic Acid Receptors", Molecular Pharmacology, Vol. 50, No. 3, pp. 616-623 (1996); and

Tsutomu YOKOMATSU et al., "Lipase-Catalyzed Enantioselective Acylation of Prochiral 2-( $\omega$ -Phosphono)alkyl-1,3-Propanediols: Application to the Enantioselective Synthesis of  $\omega$ -Phosphono- $\alpha$ -Amino Acids", Tetrahedron: Asymmetry, Vol. 7, No. 9, pp. 2743-2754 (1996).

Applicants also bring to the attention of the Examiner:

U.S. Patent No. 5,238,965;

U.S. Patent No. 6,150,345, and family member WO 00/09139 A2;

WO 00/57865 A2;

JP 5-230088 A, accompanied by an English language Abstract thereof (provided by Patent Abstracts of Japan);

JP HEI 6-228169, accompanied by an English language Abstract thereof, and a copy of Kobayashi et al., CAS: 123:144502, 1995 provided by the Examiner in an Office Action, mailed August 31, 2006, in Application No. 10/474,027;

JP 7-149772 A, accompanied by an English language Abstract thereof (provided by Patent Abstracts of Japan);

JP 7-258278 A, accompanied by an English language Abstract thereof (provided by Patent Abstracts of Japan) and a copy of Shinagawaga et al., CAS: 124:76506, 1995 provided by the Examiner in an Office Action, mailed August 31, 2006, in Application No. 10/474,027;

JP 9-25235 A, accompanied by an English language Abstract thereof (provided by Patent Abstracts of Japan);

WO 99/47101 A2;

WO 00/57864;

SCHUMACHER, K. A. et al., Thromb. Haemostas., Vol. 42, pp. 631-640, 1979;

TOKUMURA, A. et al., Lipids, Vol. 13, pp. 468-472, 1978;

FISCHER, D. J. et al., Mol. Pharmacol., Vol. 54, pp. 979-988, 1998;

IMAMURA, F. et al., Jpn. J. Cancer Res., Vol. 82, pp. 493-496, 1991;

IMAMURA, F. et al., Int. J. Cancer, Vol. 65, pp. 627-632, 1996;

SHIONO, S. et al., Biochem. Biophys. Res. Commun., Vol. 193, pp. 667-673, 1993;

MURAKAMI-MUROFUSHI, K. et al., Biochem. Biophys. Acta, Vol. 1258, pp. 57-60, 1995;

SAKURAI, Y. et al., J. Neurosci. Res., Vol. 52, pp. 17-26, 1998;

BANKER, G. A. et al., Brain Research, Vol. 126, pp. 397-425, 1977.

YOKOMATSU, T. et al., Heterocycles, Vol. 46, pp. 463-472, 1997;

BESTMANN, H. J. et al., Chemical Ber., Vol. 0.125, pp. 225-229, 1992;

Chemical Abstracts, Vol. 105, abstract No. 191524, 1986;

S. KOBAYASHI et al., Tetrahedron Letters, Vol. 34, pp. 4047-4050, 1993;

"The 23<sup>rd</sup> Symposium on Progression Organic Reactions in Life Science," November 17 and 18, 1997, The Pharmaceutical Society of Japan, Synthesis and Physiological Action of Cyclic Phosphatidic Acid and Carba Derivative, Abstract Collection pp. 101-104;

Kawai et al., Synthesis and Physiological Effects of Cyclic Lysophosphatidic Acid and Carba Derivative "The 23<sup>rd</sup> Symposium on Progression Organic Reactions in Life Science," November 17 and 18, 1997, The Pharmaceutical Society of Japan, pp. 1-9, which appears to be an English translation of the above-cited "The 23<sup>rd</sup> Symposium on Progression Organic Reactions in Life Science".

C. LAUDANNA et al., J. Biol. Chem., Vol. 272, pp. 24141-24144, 1997;

J.-M. DONG et al., J. Biol. Chem., Vol. 273, pp. 22554-22562, 1998;

G. POSTE et al., Nature, Vol. 283, pp. 139-146, 1980; and

M. MUKAI et al., Protein, Nucleic Acid and Enzyme, Vol. 44, pp. 1126-1131, 1999.

Applicants also bring to the Examiner's attention the following co-pending, commonly assigned patent application:

U.S. Patent Application No. 10/477,210 to MUKAI et al. (which published as U.S. Patent Application Publication No. 2004/0214799 A1) is a national stage of PCT/JP02/04839, filed May 20, 2002, which published as WO 02/094286 A1 on November 28, 2002;

U.S. Patent Application No. 10/474,026 to MUROFUSHI et al. (which published as U.S. Patent Application Publication No. 2004/0176329 A1) is a national stage of PCT/JP02/03659, filed April 12, 2002, which published as WO 02/083149 A1 on October 24, 2002; and

U.S. Patent Application No. 10/474,027 to MUROFUSHI et al. (which published as U.S. Patent Application Publication No. 2004/0220149 A1) is a national stage of PCT/JP02/03658, filed April 12, 2002, which published as WO 02/083148 A1 on October 24, 2002.

In accordance with 37 C.F.R. 1.98 and the waiver thereof, copies of the U.S. published patent application and U.S. patent applications are not enclosed herewith. However, if a copy is needed, the Examiner is respectfully requested to contact the undersigned.

Copies of the above-noted documents, except for the U.S. Patent Application Publication and U.S. patent applications, are enclosed together with a duly completed Form PTO-1449. Moreover, a copy of Chemical Abstract, Vol. 105, Abstract No. 191524, 1986 is not enclosed. The Examiner is requested to obtain a copy from U.S. Application No. 10/477,210. If the Examiner needs another copy, the Examiner is requested to contact the undersigned.

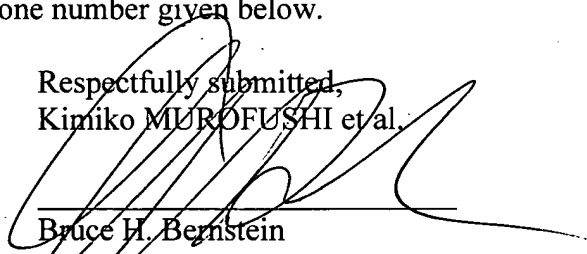
The Examiner is accordingly requested to consider each of these documents, and to make them of record in this application by initialing in the appropriate spaces on the Form PTO-1449. Applicants respectfully requests that the Examiner include a copy of the initialed Form PTO-1449 with the next communication from the U.S. Patent and Trademark Office.

Applicant notes that while this Supplemental Information Disclosure Statement is being filed more than three months from the filing date, Applicant has not received an action on the merits from the U.S. Patent and Trademark Office. Accordingly, consideration of the enclosed document is required under 37 C.F.R. 1.97(b)(3).

However, if an action on the merits has been mailed prior to the filing date of this Supplemental Information Disclosure Statement, Applicant hereby authorizes the charging of any required fees necessary for consideration of the documents cited herein to Deposit Account No. 19-0089.

If there are any comments or questions concerning this application, the Examiner is requested to contact the undersigned at the telephone number given below.

Respectfully submitted,  
Kimiko MUROFUSHI et al.



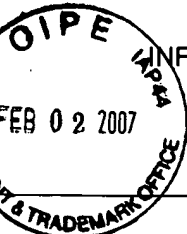
Bruce H. Bernstein  
Reg. No. 29,027

February 2, 2007  
GREENBLUM & BERNSTEIN, P.L.C.  
1950 Roland Clarke Place  
Reston, VA 20191  
(703) 716-1191

Arnold Turk  
Reg. No. 33094



FORM PTO-1449

U.S. Department of Commerce  
Patent and Trademark OfficeAtty. Docket No.  
P26378Application No.  
10/516,315INFORMATION DISCLOSURE STATEMENT  
BY APPLICANT

(Use several sheets if necessary)

Applicants  
Kimiko MUROFUSHI et al.Filing Date  
January 30, 2006Group  
1614

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		5 2 3 8 9 6 5	08/24/93	PIAZZA et al.			
		6 1 5 0 3 4 5	11/21/00	CHUN et al.			
	2004/	0 2 1 4 7 9 9	10/28/04	MUKAI et al.			
	2004/	0 1 7 6 3 2 9	09/09/04	MUROFUSHI et al.			
	2004/	0 2 2 0 1 4 9	11/04/04	MUROFUSHI et al.			

## FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO	
	00	/ 0 0 9 1 3 9	02/24/00	WIPO				
	00	/ 0 5 7 8 6 5	10/05/00	WIPO				
	99	/ 0 4 7 1 0 1	09/23/99	WIPO				
	00	/ 0 5 7 8 6 4	10/05/00	WIPO				
	02	/ 0 9 4 2 8 6	11/28/02	WIPO				
	02	/ 0 8 3 1 4 9	10/24/02	WIPO				
	02	/ 0 8 3 1 4 8	10/24/02	WIPO				
	5	- 2 3 0 0 8 8	09/07/93	JAPAN				
	6	- 2 2 8 1 6 9	08/16/94	JAPAN				
	7	- 1 4 9 7 7 2	06/13/95	JAPAN				
	7	- 2 5 8 2 7 8	10/09/95	JAPAN				
	9	- 0 2 5 2 3 5	01/28/97	JAPAN				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

1	English language Abstract of JP 5-230088, published September 7, 1993
2	English language Abstract of JP 6-228169, published August 16, 1994
3	English language Abstract of JP 7-149772, published June 13, 1995
4	English language Abstract of JP 7-258278, published October 9, 1995
5	English language Abstract of JP 9-25235, published January 28, 1997
6	W.H. MOOLENAAR, Exp. Cell. Res., Vol. 253, pp. 230-238, 1999
7	Z. GUO et al., Proc. Natl. Acad. Sci. USA, Vol. 93, pp. 14367-14372, 1996
8	HECHT, J. et al., J. Cell Biol., Vol. 135, pp. 1071-1083, 1996
9	S. AN et al., J. Biol. Chem., Vol. 273, pp. 7906-7910, 1998

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. P26378	Application No. 10/516,315
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use several sheets if necessary)		Applicants Kimiko MUROFUSHI et al.	
		Filing Date January 30, 2006	Group 1614

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	10	K. BANDO et al., J. Biol. Chem., Vol. 274, pp. 27776-27785, 1999
	11	D.-S. IM et al., Mol. Pharmacol., Vol. 57, pp. 753-759, 2000
	12	VAN CORVEN, E., et al., Cell, Vol. 59, pp. 45-54, 1989
	13	UMANSKY, S. R. et al., Cell Death Diff., Vol. 4, pp. 608-616, 1997
	14	A. GOHLA et al., J. Biol. Chem., Vol. 273, pp. 4653-4659, 1998
	15	TIGYI, G. et al., J. Biol. Chem., Vol. 267, pp. 21360-21367, 1992
	16	JALINK, K. et al., Cell Growth & Differ., Vol. 4, pp. 247-255, 1993
	17	JALINK, K. et al., J. Cell Biol., Vol. 126, pp. 801-810, 1994
	18	TIGYI, G. et al., J. Neurochem., Vol. 66, pp. 537-548, 1996
	19	IMAMURA, F. et al., Biochem. Biophys. Res. Commun., Vol. 193, pp. 497-503, 1993
	20	K. L. O'CONNOR et al., J. Cell. Biol., Vol. 143, pp. 1749-1760, 1998
	21	J. C. STAM et al., EMBO J., Vol. 17, pp. 4066-4074, 1998
	22	MURAKAMI-MUROFUSHI, K. et al., J. Biol. Chem., Vol. 267, pp. 21512-21517, 1992
	23	KOBAYASHI, T. et al., Life Sciences, Vol. 65, pp. 2185-2191, 1999
	24	LILIOM, K. et al., Am. J. Physiol., Vol. 274, pp. C1065-1074, 1998
	25	MURAKAMI-MUROFUSHI, K. et al., Cell Struct. Funct., Vol. 18, pp. 363-370, 1993
	26	P. L. HORDIJK et al., J. Biol. Chem., Vol. 269, pp. 3534-3538, 1994
	27	L. R. HOWE et al., J. Biol. Chem., Vol. 268, pp. 20717-20720, 1993
	28	T. KOBAYASHI et al., Protein, Nucleic Acid and Enzyme, Vol. 44, pp. 1118-1125, 1999
	29	MUKAI, M. et al., Int. J. Cancer, Vol. 81, pp. 918-922, 1999
	30	AKEDO, H. et al., Cancer Res., Vol. 46, pp. 2416-2422, 1986
	31	M. MUKAI et al., FEBS Letters, Vol. 484, pp. 69-73, 2000
	32	Karoly LILIOM et al., "N-Palmitoyl-serine an N-Palmitoyl-tyrosine Phosphoric Acids Are Selective Competitive Antagonists of the Lysophosphatidic Acid Receptors", Molecular Pharmacology, Vol. 50, No. 3, pp. 616-623 (1996)
	33	Tsutomu YOKOMATSU et al., "Lipase-Catalyzed Enantioselective Acylation of Prochiral 2-(ω-Phosphono)alkyl-1,3-Propanediols: Application to the Enantioselective Synthesis of ω-Phosphono-α-Amino Acids", Tetrahedron: Asymmetry, Vol. 7, No. 9, pp. 2743-2754 (1996)
	34	SCHUMACHER, K. A. et al., Thromb. Haemostas., Vol. 42, pp. 631-640, 1979
	35	TOKUMURA, A. et al., Lipids, Vol. 13, pp. 468-472, 1978
	36	FISCHER, D. J. et al., Mol. Pharmacol., Vol. 54, pp. 979-988, 1998

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

FORM PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. P26378	Application No. 10/516,315
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> (Use several sheets if necessary)		Applicants Kimiko MUROFUSHI et al.	
		Filing Date January 30, 2006	Group 1614

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

	37	IMAMURA, F. et al., Jpn. J. Cancer Res., Vol. 82, pp. 493-496, 1991
	38	IMAMURA, F. et al., Int. J. Cancer, Vol. 65, pp. 627-632, 1996
	39	SHIONO, S. et al., Biochem. Biophys. Res. Commun., Vol. 193, pp. 667-673, 1993
	40	MURAKAMI-MUROFUSHI, K. et al., Biochem. Biophys. Acta, Vol. 1258, pp. 57-60, 1995
	41	SAKURAI, Y. et al., J. Neurosci. Res., Vol. 52, pp. 17-26, 1998
	42	BANKER, G. A. et al., Brain Research, Vol. 126, pp. 397-425, 1977
	43	YOKOMATSU, T. et al., Heterocycles, Vol. 46, pp. 463-472, 1997
	44	BESTMANN, H. J. et al., Chemical Ber., Vol. 0.125, pp. 225-229, 1992
	45	Chemical Abstracts, Vol. 105, abstract No. 191524, 1986
	46	S. KOBAYASHI et al., Tetrahedron Letters, Vol. 34, pp. 4047-4050, 1993
	47	"The 23 <sup>rd</sup> Symposium on Progression Organic Reactions in Life Science," November 17 and 18, 1997, The Pharmaceutical Society of Japan, Synthesis and Physiological Action of Cyclic Phosphatidic Acid and Carba Derivative, Abstract Collection pp. 101-104
	48	Kawai et al., Synthesis and Physiological Effects of Cyclic Lysophosphatidic Acid and Carba Derivative "The 23 <sup>rd</sup> Symposium on Progression Organic Reactions in Life Science," November 17 and 18, 1997, The Pharmaceutical Society of Japan, pp. 1-9, which appears to be an English translation of the above-cited "The 23 <sup>rd</sup> Symposium on Progression Organic Reactions in Life Science"
	49	C. LAUDANNA et al., J. Biol. Chem., Vol. 272, pp. 24141-24144, 1997
	50	J.-M. DONG et al., J. Biol. Chem., Vol. 273, pp. 22554-22562, 1998
	51	G. POSTE et al., Nature, Vol. 283, pp. 139-146, 1980
	52	M. MUKAI et al., Protein, Nucleic Acid and Enzyme, Vol. 44, pp. 1126-1131, 1999
	53	Kobayashi et al., CAS: 123:144502, 1995
	54	Shinagawaga et al., CAS: 124:76506, 1995

EXAMINER

DATE CONSIDERED

\*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.